REMARKS

The objection to claim 1 has been overcome by amendment.

The rejection of claims 1 to 17 as being obvious over Qvintus et al (WO 97/10379) is traversed.

Independent claim 1 recites a treatment step in the bleaching of chemical pulp, wherein the pulp is treated in an ozone, chlorine dioxide or alkali stage and the pulp is subsequently washed in a washing device having an E_{10} value of at least 3 such that washing liquid is introduced into the washing device counter-currently in relation to the pulp, and filtrate is discharged from the washing device. The pulp is washed in the washing device. A first washing liquid comprises circulated filtrate from the washing device in an amount of 1.5 - 3.5 t/adt pulp. Thereafter the pulp is washed with a second washing liquid, e.g., fresh washing liquid, so that the dilution factor (DF) in the second washing liquid is less than 1 t/adt and the total DF in the washing device is more than 0 t/adt.[1] Thus, the DF in the second washing liquid can be (and preferably is) below than zero.

The prior art teaches that it is not possible to reach a satisfactory washing result between bleaching stages without an adequate amount of fresh water (second washing liquid) introduced from the outside (see explanation on page 5, lines 26 - 34 of the present application). Balance calculations have shown that reusing wash water inside one and the same bleaching stage in practice leads to the same washing result as when using

only externally-introduced washing liquid, as long as the total dilution factor is the same and the efficiency of the washing device is high enough to ensure an adequate purity of the circulated filtrate fraction. This is a surprising result, as the art has always taught that without an adequate amount of water introduced from outside it is not possible to reach a satisfactory washing result between bleaching stages. A person of ordinary skill in the art would expect that the washing result is deteriorated if the internal circulation is increased and the use of fresh water is decreased. The claimed method of washing will, however, remarkably decrease the water consumption of bleaching plants without significant additional investments.

The differences between the present invention and Qvintus (having an European counterpart publication EP 856079) are discussed on page 1, lines 13 - 21 of the present application. According to Qvintus, at least a part of the filtrate stemming from a suction, pressing or thickening stage following the washing is used as washing liquid in a washing stage which immediately precedes the suction, pressing or thickening stage. A part of the filtrate from the last washing stage may also be returned to the beginning of this washing stage for use as washing liquid. As a result, the amount of liquid used for washing the pulp can be increased, thus improving the washing results as compared to the situation where only new liquid is introduced for washing purposes. As shown in Qvintus, the washing result is improved, and washing losses are reduced when a suction filtrate and a

[1] The dilution factor DF, or washing water surplus, is explained on page 3, lines 24 - 31, and page 4, line 34 to page 5, line 8 of the application.

part of a displacement filtrate are directed to the washing stage (see Figure 6 and page 11, lines 25- 31).

However, there is no disclosure or teaching in Qvintus to decrease the amount of fresh washing liquid (second washing liquid) as is done in the present invention.

In accordance with Qvintus, it was realized that the washing process can be made more efficient by supplying the suction filtrate to the last washing stage, rather than to the penultimate washing stage, and that a portion of the filtrate from the last washing stage is used as washing liquid in the same washing stage. No decrease in the amount of fresh washing liquid is observed in Qvintus. Qvintus suggests that the washing results can be improved by using the internal circulation of filtrate. Still, in agreement with conventional prior art, Qvintus also teaches that it is not possible to reach a satisfactory washing result between bleaching stages without an adequate amount of fresh water introduced from the outside (see explanation on page 5, lines 26 - 30 of the present application). As a result, those of ordinary skill in the art would expect that the washing result is deteriorated if the internal circulation is increased and the use of fresh water is decreased. Hence, without using hindsight, a person of ordinary skill in the art would not arrive at the present invention from Qvintus.

The Office Action, states that:

> "[w]ith respect to the values of dilution factor, it is a result effective variable based on the amount of water entered into

> the drum, the amount of spinning performed, and the desired final consistency, as all taught by Qvintus. All these variables are easily controlled by one ordinary skill in the art…, and it has been held that optimizing result effective variables through routine experimentation is within the ability of one of ordinary skill."

The present method is not based on the control of the variables listed by in the rejection. A novel feature of the present method is that in bleaching the use of water, especially fresh water, coming from outside a wash stage in question, may be decreased, such that the washing is completed under a shortage of washing water. This would result in a poor washing result between bleaching stages, if the internal circulation inside a washing stage would not be practiced. The teaching of Qvintus is contrary to what the present method discloses. That is, e.g., in Figures 12 - 14 of Qvintus, the internal circulation of filtrate is increased from 1.98 to 3.11 (see the third numerical value from the right in the bottom part of each of the Figures). Yet, the amount of fresh water (WI) is kept constant. This supports the consistent teaching in this art, namely that it is not predictable to reach a satisfactory washing result between bleaching stages without an adequate amount of water introduced from the outside. In Figures 6 and 12 - 14 of Qvintus, the dilution factor in the latter wash is in fact higher than 1 t/adt as presently claimed, namely 7.6 - 5.1 = 2.5 t/adt. As a result, the inventive combination of a low amount of fresh liquid, expressed as a dilution factor of less than 1 t/adt, and an amount of the circulated filtrate of 1.5 - 3.5

t/adt pulp was not obvious to the skilled person at the filing date. In paragraph 7. of the Office Action the Examiner refers to page 11, line 14 of Qvintus. Here it is described that 2,5 tons of liquid is removed from the web and the system, but this is not the amount of the circulated filtrate.

The references included in the PCT Search Report should be considered by the USPTO, if they have not already been considered. In this National Stage application, the USPTO should consider the reference cited in the PCT Search Report. An Information Disclosure Statement (IDS) is being submitted which identifies these references.

All claims are in good condition for allowance. If any small matter remains outstanding, the Examiner is requested to telephone applicants' attorney. Prompt reconsideration and allowance of this application is requested.

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed

herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: /Jeffry Nelson/

Jeffry H. Nelson
Reg. No. 30,481

JHN:glf

901 North Glebe Road, 11th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100